

Liberating Nicotine from Smoke to Save Lives Now:

Facing and Answering 7 Core Questions^{*} to Guide Regulation, Policy, and Communications.

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^{*} The 7 core questions were originally put forth by Mitch Zeller, Director, Center for Tobacco Products, U.S. Food and Drug Administration.

Background

E-cigarettes and vaping are a contentious and complicated issue, and they also raise critical questions about society's acceptance of the use of nicotine in any form. Seven core issues[†] are raised by the emergence of a class of innovative products (like e-cigarettes) as alternative modes of nicotine delivery without combustion of tobacco. Emerging products are fundamentally changing the way nicotine is delivered and may disrupt the 120+ year reign of the cigarette as the dominant mode of delivering a deadly inhaled mix of toxic smoke along with nicotine.

The 50th Anniversary Surgeon General's Report bluntly concluded: *"The burden of death and disease from tobacco use in the United States is overwhelmingly caused by cigarettes and other combusted tobacco products; rapid elimination of their use will dramatically reduce this burden"* p.7 and *"The current rate of progress in tobacco control is not fast enough. More needs to be done."* p. 875.¹

Going forward, to minimize preventable premature death and suffering as quickly as possible, we present these responses to the seven issues, integrating both current science and values-based policy analysis to the critical questions that underpin regulations and communications on nicotine. Our focus is on the core issues raised by nicotine; at times, we mention vaping as a topical and clearly popular example, but vaping is merely an example, not the central issue. The central focus is more generally about reframing nicotine use² to complement and enrich existing tobacco control strategies in the context of the very different modes of nicotine delivery when decoupled from the toxins in the inhaled smoke from combusted tobacco.

Can longer-term use of nicotine for those who need it be accepted?

As an alternative to the high probability of premature death from smoking, long-term use of nicotine delivered by relatively less harmful, non-combusted means is acceptable. The smoke inhaled from burning tobacco (combustibles like cigarettes) is deadly from the carbon monoxide and cancer-causing chemicals in the tar and **not** from the nicotine itself.^{1,3} For every two people who continue a lifetime of smoking, one life will be lost prematurely.⁴ People smoke for the nicotine but they die from the tar.⁵ Providing smokers with acceptable less harmful nicotine alternatives can yield massive health benefits. As an example, e-cigarette use (called vaping) is dramatically less harmful than combustibles. The United Kingdom Royal College of Physicians says: "Although it is not possible to precisely quantify the long-term health risks associated with e-cigarettes, the available data suggest that they are unlikely to exceed 5% of those associated with smoked tobacco products, and may well be substantially lower than this figure" (p. 87).⁶ Expert reviews of toxicological, clinical, and epidemiological evidence indicate that nicotine does not cause cancer and that the chemicals released during vaping are far fewer and well below the harm from inhaled smoke.^{3,6-10} New data should always be considered and added to the available evidence, but the public deserves our best judgment based on what we now know.

The dramatic difference in risk and in product characteristics between non-combusted modes of nicotine delivery and the toxic inhaled smoke from combustion should drive both personal decisions and the policy discourse about nicotine. The alternative classes of emerging products are vastly different from cigarettes. Thus, harms from nicotine also vary dramatically by different modes of delivery, including FDA-approved nicotine replacement medicinal products, non-combusted products like e-cigarettes and low-nitrosamine Swedish snus, all of which likely (or almost certainly) can be used long-term by most smokers with little evidence of harm from the long-term use of nicotine itself.^{3,6,11}

What about recreational nicotine use for adults who may want it?

Users of noncombustible nicotine should know there may be some risks, although dramatically smaller than the risk of cigarettes and other combustibles^{6-8,12} and should be able to choose based on accurate

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relative risk information. In terms of impacts on health, recreational use of noncombustible nicotine by adults is vastly different from combustible smoking; the two should not be equated and such misperceptions should be corrected. Consumers must have full accurate and up-to-date information about relative harms of the different classes of nicotine products to make informed decisions.¹³

Can a short transitional period of dual use be ok? Or a longer period?

Using both noncombustible nicotine products and cigarettes (dual use) is common among those attempting to quit smoking;¹⁴⁻¹⁶ most smokers quitting with FDA-approved nicotine replacement therapy (NRT) still smoke and such use is permitted by labeling.¹⁷ Basically, dual use is a transition where a smoker tries out alternative products and methods until they find one that helps them stop smoking. This process can take time and should not be discouraged as a pathway towards eventual quitting or exclusive use of less harmful products. The goal must remain stopping use of combustibles completely and as soon as possible, but some smokers may need longer transition periods to achieve this goal. There is increasing scientific evidence that those who persist in finding an alternative nicotine product that is appealing and satisfying to them and then use it daily over an extended period (e.g. a month or more, rather than only a few times) are much more likely to quit smoking cigarettes or become exclusive e-cigarette users during the year following cessation of cigarettes.^{8,16,18-22}

How much youth initiation can we tolerate?

We should strive to prevent all youth initiation of nicotine. We should prohibit the sale of all nicotine-containing products to those under legal purchase age, something we are now doing in all 50 states. But this goal must be tempered by the realities of adolescent behavior despite our best prevention efforts.

Even with sales prohibitions, some youth will at least experiment with novel products, via “leakage” of products sold to adults into the underage market as youth do with many products, especially those predisposed to risk taking. On the one hand, if the leakage is to teenagers who otherwise would never have used nicotine in any form it is a potential concern from a health perspective if use persists beyond experimentation. A more substantial concern would accrue if some of those who would otherwise have been non-users of nicotine subsequently transition to becoming lifetime cigarette smokers. But the extent, or even the existence, of that behavior pattern remains unknown. On the other hand, use of e-cigarettes by those who otherwise would have started smoking anyway – or those who are already smoking and trying to quit – likely might represent a net health gain if e-cigarette use indeed displaced or prevented further progression to cigarette use.

Kozlowski and Warner (2017) carefully reviewed the evidence to date concerning the actual patterns of e-cigarette and tobacco use as well as the concerns of excessive harms to youth of having alternative less harmful forms of nicotine delivery on the marketplace.²³ After a steep rise from 2011-2014, e-cigarette use among youth dropped significantly in 2016 and use remains largely experimental and among those already using tobacco.²⁴⁻²⁷ Kozlowski and Warner (2017) concluded that while society must be vigilant in tracking trends, the fears of harms seem to be exaggerated and are unlikely to undermine the larger potential benefits of alternative nicotine delivery systems being on the market (see also: Levy et al, 2016; Villanti et al 2016; Warner, 2015; 2016; Glasser et al, 2017).^{8,25-28} Such modes of delivery ideally should eventually make the use of smoked tobacco obsolete, protecting youth and adults alike from the most deadly form of nicotine delivery via combustion.²⁹ Moreover, for adults and society in general, misleading youth or keeping from them truthful information to get them to do what we want is always a failed strategy.¹³

How much weight should diminished interest in quitting play?

There is no evidence to suggest that meaningful numbers of people who have tried e-cigarettes or initiated dual use will stop there and lose all interest in achieving full cessation of combustibles. In fact, in the

years when e-cigarette use has increased most sharply, we have seen a faster drop in cigarette use among both adolescents and adults, leading to record low rates - and we also have seen a greater number of quit attempts in adults over that same time period.^{16,23,26,27,30,31} Until and unless evidence emerges that vaping substitutes for quitting, the possibility that it might deserves little weight in decision-making. What's more, increasing evidence from recent and more scientifically robust studies indicates that alternative nicotine delivery systems, such as e-cigarettes, have surpassed nicotine replacement therapies as the leading method smokers are using to quit smoking.¹⁶ E-cigarette use is also associated with greater numbers of quit attempts and cessation success when used on a regular basis and with the availability of newer devices that deliver nicotine more effectively.⁸

Can we revise labeling and indications for medical nicotine to increase quitting?

Quitting smoking is hard. Information that improves quit rates is therefore valuable. Many smokers wrongly believe any use of nicotine is as harmful as the use of combustibles;³²⁻³⁴ to some extent, that belief stems from misguided public health efforts. Smokers should know that nicotine without smoke is much less damaging to their health than nicotine in combustibles. Non-combustible nicotine products can be useful for smoking cessation.^{8,16,19,22,35,36} Alternative nicotine delivery can help smokers cut down and eventually quit by reducing the urge to smoke or preventing relapse.¹⁷ Sound public education must fully communicate the relative safety of different modes of nicotine delivery and especially when nicotine is decoupled from combusted tobacco smoke.¹³

Where does the principle of harm reduction come in?

Harm reduction, like in many other areas of public health, should be embraced in tobacco control. It is a pragmatic approach that complements and enriches our proven current tobacco control efforts. Harm reduction is often misunderstood in the tobacco control community. Contrary to some skeptics' characterizations, harm reduction acknowledges that no use of nicotine is preferred to any use of nicotine; thus, both prevention of any use of nicotine by underage youth and cessation of smoking by adults is desirable. However, for those who continue to smoke, it is pragmatic to recommend using lower-harm alternatives to combustibles to save many more lives that would otherwise be lost prematurely. This harm reduction strategy is consistent with the 50th anniversary Surgeon General's admonition that more must be done now to eliminate the preventable deaths overwhelmingly caused by cigarettes and other smoked tobacco use.¹

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